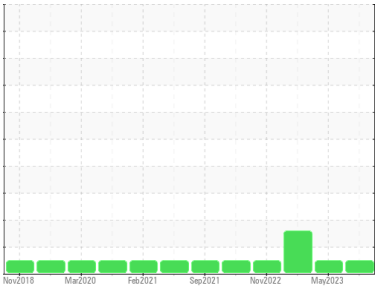
OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Area
Propulsion
Machine Id
SB ME (S/N 512100615)
Component
Starboard Main Engine
Fluid
SHELL ROTELLA T4 15W40 (70 LTR)

DIAGNOSIS

Recommendation
We advise that you check the cylinder liner seals for deterioration to ensure that cooling water is not entering the sump. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition.

Wear
All component wear rates are normal.

Contamination
Elemental level of sodium (Na) and/or boron (B) indicates a possible cooling water leak.

Fluid Condition
Additive levels indicate the addition of a different brand, or type of oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC**	WC	WC
Sample Date		Client Info		**25 Sep 2023**	24 May 2023	16 May 2023
Machine Age	hrs	Client Info		**0**	0	0
Oil Age	hrs	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**NORMAL**	NORMAL	MARGINAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	**<1.0**	<1.0	<1.0
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>75	**12**	6	6
Chromium	ppm	ASTM D5185(m)	>8	**<1**	<1	<1
Nickel	ppm	ASTM D5185(m)	>2	**<1**	<1	<1
Titanium	ppm	ASTM D5185(m)	>3	**0**	<1	<1
Silver	ppm	ASTM D5185(m)	>2	**<1**	0	0
Aluminum	ppm	ASTM D5185(m)	>15	**1**	1	1
Lead	ppm	ASTM D5185(m)	>18	**1**	<1	<1
Copper	ppm	ASTM D5185(m)	>80	**2**	1	1
Tin	ppm	ASTM D5185(m)	>14	**0**	<1	<1
Antimony	ppm	ASTM D5185(m)		**0**	0	0
Vanadium	ppm	ASTM D5185(m)		**0**	0	0
Beryllium	ppm	ASTM D5185(m)		**0**	0	0
Cadmium	ppm	ASTM D5185(m)		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)		**81**	119	126
Barium	ppm	ASTM D5185(m)		**<1**	0	0
Molybdenum	ppm	ASTM D5185(m)		**0**	0	0
Manganese	ppm	ASTM D5185(m)		**0**	<1	<1
Magnesium	ppm	ASTM D5185(m)		**13**	12	12
Calcium	ppm	ASTM D5185(m)		**2484**	2507	2429
Phosphorus	ppm	ASTM D5185(m)		**1031**	1095	1077
Zinc	ppm	ASTM D5185(m)		**1273**	1211	1186
Sulfur	ppm	ASTM D5185(m)		**2989**	3045	3054
Lithium	ppm	ASTM D5185(m)		**<1**	<1	<1

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>20	**7**	7	7
Sodium	ppm	ASTM D5185(m)	>75	**3**	2	2
Potassium	ppm	ASTM D5185(m)	>20	**7**	7	8

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	ASTM D7844*		**0.5**	0.4	0.4
Nitration	Abs/cm	ASTM D7624*	>20	**10.0**	8.8	9.0
Sulfation	Abs/.1mm	ASTM D7415*	>30	**24.0**	23.2	24.0

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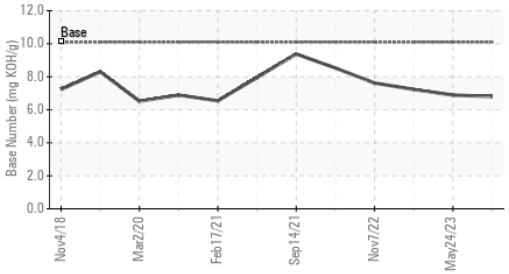
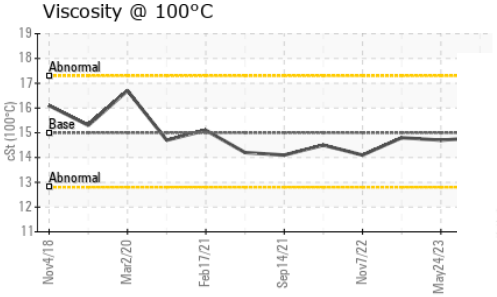
Base Number



Viscosity @ 100°C



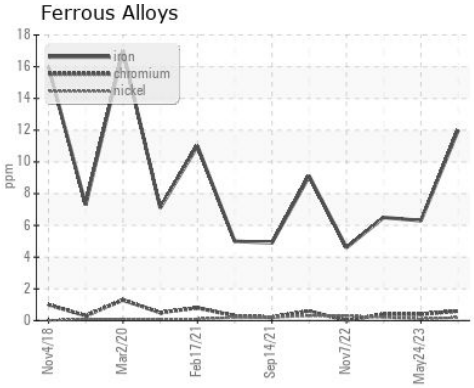
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	ASTM D7414*	>25	**20.1**	19.2	19.5
Base Number (BN)	mg KOH/g	ASTM D2896*	10.1	**6.80**	6.89	7.23

VISUAL		method	limit/base	current	history1	history2
Emulsified Water	scalar	Visual*	>0.1	**NEG**	NEG	NEG
Free Water	scalar	Visual*		**NEG**	NEG	NEG

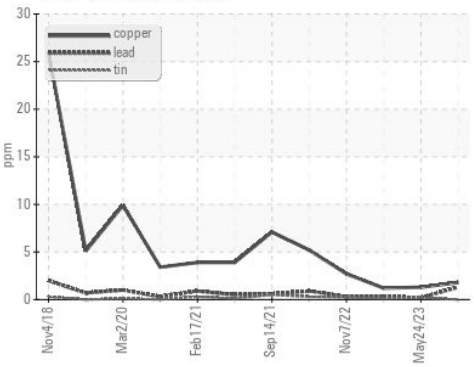
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D7279(m)	15	**14.8**	14.7	14.8

GRAPHS

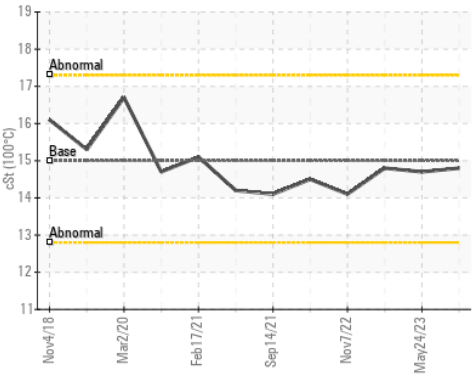
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



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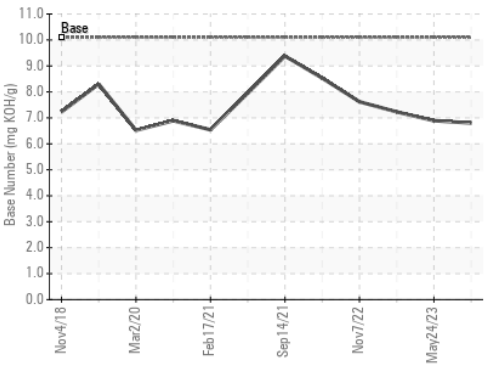

ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC
Lab Number : 02587135
Unique Number : 5656201
Test Package : MAR 2

Received : 05 Oct 2023
Diagnosed : 10 Oct 2023
Diagnostician : Kevin Marson

To discuss this sample report, contact Customer Service at 1-800-268-2131.
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
Validity of results and interpretation are based on the sample and information as supplied.

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